

### Abstract

The present invention pertains to a method of controlling an accelerator coupled nuclear system comprising a nuclear reactor operating in subcritical mode and a neutron generator device using a beam of charged particles originating from an accelerator, said neutron generator supplying the quantity of neutrons necessary in order to maintain the nuclear reaction. Said method is characterized in that the operating point is determined by giving the energy  $E_p$  of the particles a value greater than or equal to the value  $E_{pMax}$ , which maximizes the production of neutrons, and in that the number of neutrons is adjusted by acting on the energy of the particles originating from the accelerator, with constant beam intensity. The present invention also pertains to the accelerator coupled hybrid nuclear system used for same.